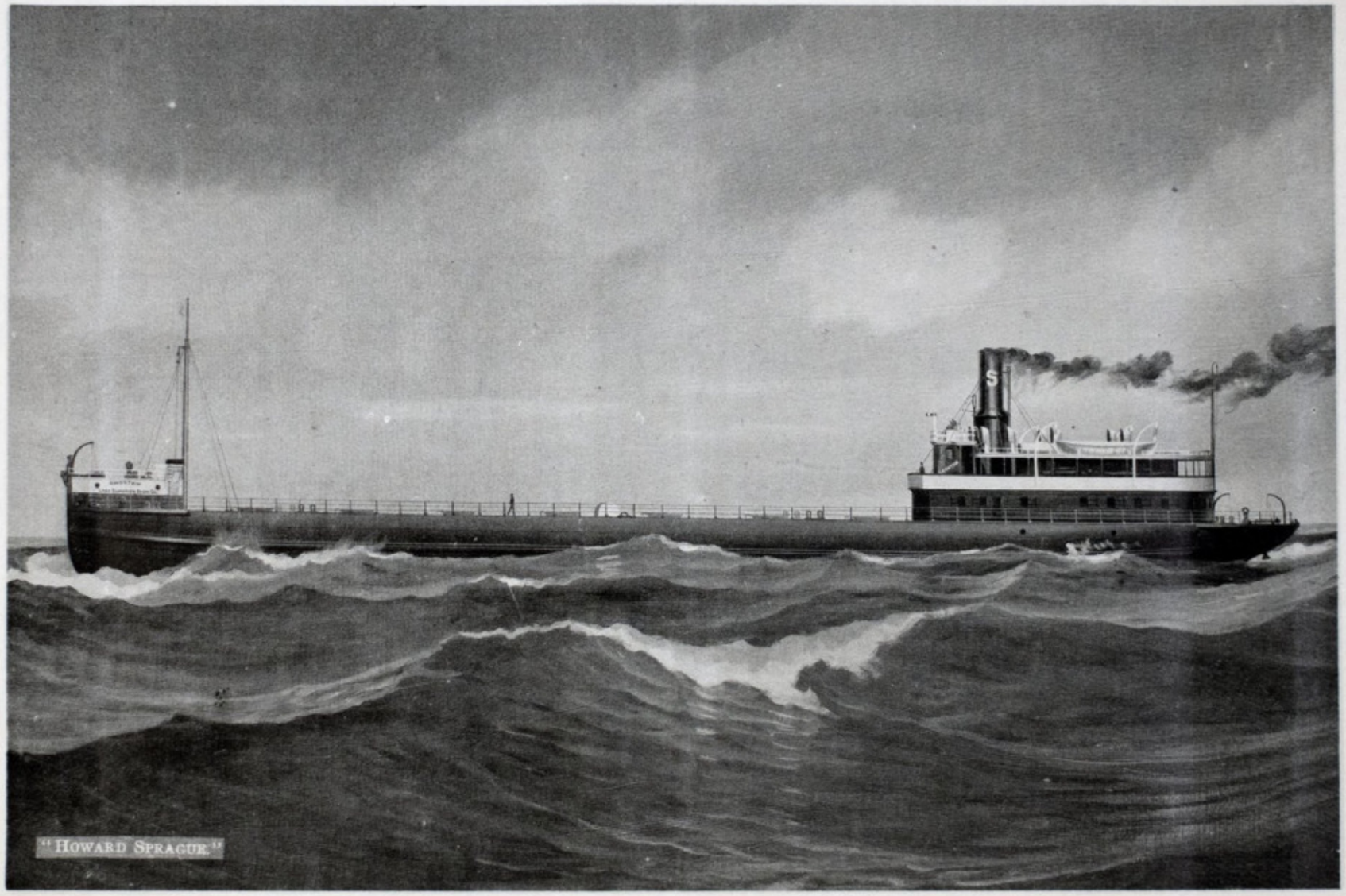


Supplement to THE MARINE RECORD, Cleveland, Ohio.

STEEL STEAMER CHOCTAW,

Built by THE CLEVELAND SHIP-BUILDING CO.

DIMENSIONS:

Water Line,	266 feet.
Beam,	38 feet.
Molded Depth,	22 feet 4 in.

CAPACITY:

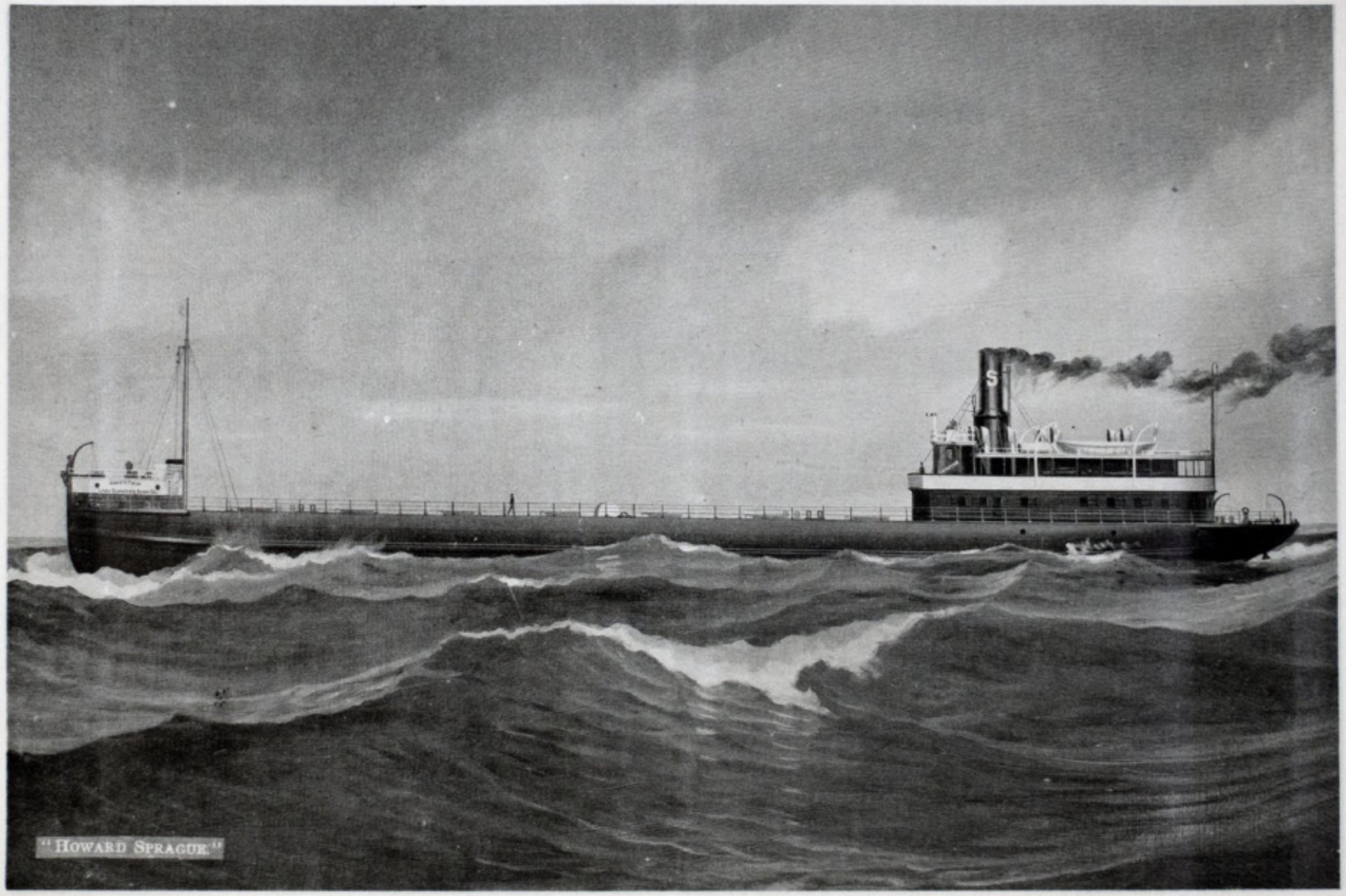
Fuel and Cargo, 2683 net tons on 15 feet draft.

MACHINERY:

Engines,	Triple Expansion
Cylinders,	17 in., 29 in. and 47 in.
Stroke,	36 inches.
Boilers,	Two, 11 ft. diameter, 12 ft. long.

SPEED:

Light, 13 miles; loaded, 12 miles.



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THE MARINE RECORD.

DEVOTED TO COMMERCE, ENGINEERING AND SCIENCE.

ESTABLISHED 1878.

VOL. XV. CLEVELAND, OHIO, JULY 7, 1892. NO. 28.

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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CLEVELAND, O.

Mr. Thos. Bristow, of the Cleveland Ship Building Co., and Mrs. Bristow were among the passengers in the stranded steamer City of Chicago. Their 200 feet scale up the Kinsale cliffs was a side issue which they had not reckoned upon.

The Globe Iron Works Co., will take about ten days to repair the bottom damage on the steel steamer German ashore last week on North Fox Island, about fifteen plates will be removed.

Conneaut, O., has applied to Collector Gary, for a deputy to be stationed at that port. The request may strike Cleveland people in this way. If the shipping facilities and approaches to this port are neglected minor ports will surely take away the bulk of our commerce and the Ashtabula lesson be taught over again.

The schooner Racine owned and sailed by Captain Fish stranded near Point aux Barques last Saturday and was only saved by first class wrecking work carried on by the tug Frank W. of Alpena, although an old vessel the Racine was given a thorough rebuild at this port last winter and it is now reported that she is not so badly damaged as it was at first thought. She was insured for about half her value.

Captain Tom Wilford, speaks in high terms of the new steamer Samuel Mitchell built by the Globe Iron Works Co., this season, she brought into port 2280 tons of Ashland ore on Tuesday and came across from Point au Pelee, a distance of forty-eight miles, in three hours and forty minutes. Her engines give the most perfect satisfaction.

The fine little passenger steamer Joe Milton, in charge of Captain Hough, is now making regular weekly trips between Port Stanley and this city, she arrives here on Saturday evenings returning Monday.

Mr. W. J. White, vessel owner and a manufacturer of chewing gum is a candidate for congressional honors from the twentieth district on the republican ticket.

Mr. A. A. Parker, of the firm of Parker & Millen, Detroit, has been spending a few days in the city attending to his vessel property. The firm have had six vessels in port since Monday, and prompt dispatch is considered of first importance in the handling of the large fleet managed by Parker & Millen.

The inspection papers of the following named steamers enrolled in this district expire on the dates given herewith:

July 8,	Allie May.	July 21,	Laura,
" 9,	Jas. C. Lockwod.	" 23,	Titania.
" 10,	Straightaway.	" 25,	Italia.
" 13,	L. Birkhead.	" 27,	Geo. Spencer.
" 13,	Sigma.	" 27,	Kittie Downs.
" 13,	Karl.	" 28,	Louiea.
" 14,	Matoa.	" 31,	Empire.
" 15,	Siberia.	" 21,	Farragut.
" 16,	Alethe.	" 31,	Rajah.
" 18,	William Chisholm.	" 31,	Roland.
" 21,	Geo. F. Williams.	" 31,	Romain.

July 31, N, B. Gates.

Adjuster Parsons, of Buffalo, has been in port during the week surveying and adjusting the damage on the schooner Minnehaha released from her stranded position near Detour.

Capt. OrvilleW. Green, of the steel steamer Griffin, was in port this week looking well and as hearty as usual. Capt. Green is more than pleased with his new command and he classes her as being all that any man could desire to handle, regular trips and a large carrying capacity on a moderate draft, speak highly for the Cleveland Ship Building Co., builders of the Griffin.

The light-house tender Lilac will leave the yards of the Globe Iron Works Co., at 7 a. m. Monday on her trial trip. Capt. George A. Simpson will adjust her compasses. Her sister ship, the Columbine is also well along towards completion and will soon be ready to leave for the coast.

Active work is being carried on at the yards of the Cleveland Ship Building Co. on the third of the monitor type freight carriers. The Andaste and Choctaw have proved such economical carriers that the one now on the stocks will be given a larger carrying capacity than either of her sister ships. The engine building, machine shops, boiler department, and foundry are kept working to their full capacity and a vast quantity of work is being regularly turned out by this extensive firm.

At the office of the Globe Iron Works Co., no information could be given regarding the new passenger steamer contracts, neither the general manager, Mr. John F. Pankhurst nor Mr. Luther Allen were open to say a word about the report coming from Buffalo that the boats were contracted for, although it is understood that negotiations have been entered upon. The Globe have now four new steamers lying at the shipyard receiving their finishing works, with nothing on the stocks, and it is safe to say that the quarter of a mile of ways will not long remain empty. Plans and specifications for passenger, railroad transfer, freight and government steamers have all been got out and the busy hum of the shipyard work is likely to be heard again very shortly.

CONTRACT FOR LARGE PASSENGER STEAMERS. BUFFALO NOTES.

Special Correspondence to The Marine Record.

BUFFALO, N. Y.—The union lumber shovers quit work Tuesday night and President Miller ordered a general tie-up. At a meeting the union declared war against the stevedores and a battle to the finish will be the result. The tie-up catches the schooners Knight Templar, Antelope, steamer Westford and barge Alvina, steamer Benton and barge Davis, steamer M. Sicken, and barges Lester and Jenness. The union found they could not employ all their men as long as the stevedores kept getting boats to unload and therefore resolved to crush them out entirely or get crushed themselves.

The Woodlawn Beach Co., which is to open a new summer resort up the South shore this month, have bought the old side-wheel steamer Corona, now in dry dock at Manitowoc. It is understood the Corona has been extensively rebuilt, but Buffalo pleasure seekers will groan at the addition of another old boat to the excursion fleet. It seems that anybody who has an old boat to sell can find a ready market for her in Buffalo There are but two first class excursion steamers of any size that run out of this port.

President Hoganson, of the Seamen's Union, is a kind-hearted man. No sooner had he learned that a sailor named Schwartz had been lost off theschooner C. P. Minch than he went aboard the vessel and told Capt. Kaufman that he would take charge of the dead sailor's effects and wages and forward them to Schwartz's sweetheart, who lived in Chicago. Capt. Kaufman, touched by Hoganson's kind offer, at once turned over about $40 in cash and all of Schwartz's clothing. Their arrival at Chicago has not yet been reported.

The steamer John B. Lyon completed her repairs and cleared for Chicago Monday. She is a fine looking boat in her new rig.

The damage to the schooner William Home by grounding on Horseshoe Reef, last week, foots up about $1,000.

The biggest sensation of the season was sprung Wednesday morning, when it was announced that a line of magnificent passenger steamers would be built to run between Superior and Buffalo. The report stated that a contract for two steel steamers had been let to the Globe Iron Works Co., each vessel to cost $400,000. The fact that the Northern Steamship Company and the Great Northern Railway are said to be back of the scheme, lends color to the report, as it is known that this railway has been for some time figuring on a water route to Buffalo. The new steamers are to be ready in a year and will make the trip in 50 hours. The new company will have a capital of $2,000,000, and will be incorporated in Ohio under the style of The Great Lakes Steamship Company. The general dimensions of the steamers are given as 360 feet keel, 40 feet beam and 26 feet depth of hold and to have an average speed of 19 miles an hour.

There was a very strong current in Buffalo river July 3 and 4, and the large fleet arriving had great difficulty in reaching dock. But few vessels were moved.

The barge C. H. Davis, which was out in last week's blow on Lake Erie, came into port in a water-logged condition. She will be docked here.

The old New Bedford whaler Progress, on her way to the World's Fair, spent several days at this port, leaving last Tuesday night for Detroit. The Progress is an odd looking old craft. Though but 90 feet keel and 107 feet over all she has 19 feet depth of hold, and has been loaded to an 18 foot draught. She was built in Connecticut in 1840. She originally cost something over $30,000, her present owners paid $4,000 for her and by the time she gets to Chicago another $4,000 will have been spent in tow bills. Capt. Gifford and Mate Davis have the Progress in charge and she left here in tow of the City of Berlin.

Kellogg's new elevator is rapidly nearing completion. The house will have a capacity for 500,000 bushels.

Coal shipments for last month were 376,029 tons against 396,083 tons for June, 1891. Total shipments for the season thus far are 759,931 tons, against 812,290 in 1891.

Coal freights rule steady at the old rates and have been quite active for the past week, notwithstanding the fact that receipts by rail have continued lighter. Chicago, and Milwaukee and Duluth coal has been moving most freely. The situation is easy and rates to these points apparently firm. The Erie Canal is doing almost no business. Rates are almost nominal at 2¼ cents for wheat, 2 cents for corn, 1½ cents for oats to New York.

Notes.

A GROUP of Caribs from the Lesser Antilles, descendants of the cannibal race discovered by Columbus on his second voyage, will be at the World's Fair, engaged in making baskets and in other native industries.

THE powerful wrecking tug Favorite of the Swain Wrecking Co., did good work last week in releasing the large propeller German from her stranded position on North Fox Island, 400 tons of ore were jettisoned before she was towed off.

The Canadian Pacific Steamship Company has agreed to make a rate of $10 a ton on World's Fair exhibits from ports of China and Japan consigned to Vancouver, or $16 a ton through to Chicago. This is a reduction ranging from 33 to 65 per cent. Passenger rates are reduced about one-half.

THE Harvard-Yale boat race at New London is very effectively illustrated in *Harper's Weekly* published June 29th. Besides views of the quarters and boat houses of Columbia, Harvard, and Yale, there are twenty portraits of members of the competing crews from photographs taken especially for this purpose.

ONE of the novel exhibits in the marine section of the Transportation Department at the World's Fair, will be 200 pen engravings of American steam vessels, beginning with the Clermont and following down a typical series to the present day. The pictures will be sent by the New York *Seaboard*, a marine paper.

THERE is no longer any question of what style, class or make of lead pencils may be ordered for any and all purposes. The Joseph Dixon Crucible Co., Jersey City, N. J., carry the palm and others are simply "not in it." The American graphite skillfully directed covers more paper in a given time than all other lead pencil compositions combined.

THE classification of ships is amended in the U. S. Navy to read as follows: Ships of and above five thousand tons displacement will be classed as first rates; those of and above, three thousand but below five thousand tons displacement as second rates; and all those of less than one thousand tons displacement as third rates.

THE business of the Morris Machine Works, Baldwinsville, N. Y., of which W. F. Morris was sole owner, has been incorporated under the laws of the State of New York, the old title being retained. The capital stock of $300,000 is full paid, thus giving the new organization ample means with which to prosecute its business. This, in connection with superior facilities, should be sufficient assurance to their patrons that the new concern will fully maintain the reputation of the old. Mr. W. F. Morris is president of the stock company.

The Secretary of the Treasury has awarded the contract for the construction of the U. S. life saving station, authorized to be erected upon the grounds of the World's Columbian Exposition at Chicago, for $7,898. The station will be a part of the government's exhibit at the Fair. It will be one of the most complete of its kind ever erected and will serve to illustrate in the best manner the organization and methods of the life-saying service. It will take the place of the present Chicago life saving station, the crew of which will be moved to the new station.

IT is understood that the negotiations are still in progress for the establishment at East Deering, Me., of a steel shipyard for the construction of whaleback and other vessels. The company owning the McDougall whaleback patents is a close corporation with a capital of $4,000,000, and it is not understood that the company desires to sell any stock. It wants exemption from taxation for a term of years, a concession which Deering ought to be only too glad to grant. The Eastern Forge Co. would either be absorbed by this company or else taken into partnership. Negotiations have been pending off and on, since last November, but it has not yet been learned that the desired result is any nearer now than it was then.

ON the modern steamer, according to Prof. J. H. Biles, of Glasgow, one man with all the latest appliances at command, can produce as much work as was possible for 150 men on the old-time vessels propelled by manual power. Further improvement is still possible by the use of lighter machinery, boilers of the tubular type, and oil as fuel instead of coal. Even with such improvements, however, it would take a vessel 1,000 ft. long and 100 ft. wide, with engines of 100,000 to 120,000 indicated horse power to cross the Atlantic from Queenstown to New York in four days. But as the propelling power of steamers has been multiplied by six in the last fifteen years, engines of 30,000 horse power being now known, it is not unreasonable to assume that in the next fifteen years the maximum horse power will be quadrupled.

THE American Steel Barge Co., of Superior, Wis., recently wrote to the Treasury Department in regard to the free entry under section 8 of the tariff act of materials and machinery for use in the construction of vessels at Everett, Washington, where the company has established a large ship-yard. Assistant Secretary Spaulding has informed the company that rivets, iron or steel, cannot be admitted under the section in question; that the materials enumerated in that section can be admitted free whether they are to be used in the construction of the hull or of the engines and boilers, that the term "equipment" as used in that section is not understood to include donkey engines, pumps, windlasses, steam steerer and other machinery, but does not include anchors, chain cables, boats, life saving apparatus, nautical instruments, signal lights and similar articles.

A WATER TUBE BOILER.

The Roberts Safety Water Tube Boiler Co., of 18 Cortlandt street, New York, and Red Bank, N. J., are rapidly approaching their five hundredth boiler. They are now building boilers of about 40 square feet of grate for the Titusville Electric Light Co., and also for Ross & Sanford's tug "Margaret J. Sanford", as well as a large boiler for a Pacific coast steamer owned at Portland, Oregon. They have also furnished a boiler of about the same size for Mr. Ed. Stokes' steam yacht "Fra Diavolo" and a boiler with about 24 square feet of grate for a new fast steam yacht on Lake Champlain, owned by Kellogg & Averill. Rev. Aspinwall's new steam launch "Secret" has one of these boilers and is reported to develop about 20 miles an hour, and the duplicate boiler is in a new launch owned by ex-Mayor Howell, of Brooklyn, and he expects to develop similar speed. The new Roberts boiler in the "Bo-Peep" will probably be tried this week and the one in the Dock Department launch is giving the best of satisfaction. The owners of the steam yachts "Theresa" and "Evelyn" are reported to be exceedingly well pleased with the Roberts boilers in their yachts. They have 33 and 28 square feet of grate respectively. This Water Tube Boiler Company seem to be doing a rushing business, having sold over 150 boilers during the past season, according to the recorded sales which we have on hand.

NAVAL ARCHITECTURE IN AMERICA.

A department of naval architecture and marine engineering has been established in connection with the Cornell University, one of the chief seats of learning in the United States. Professor W. F. Durand, the principal of the school, is about to start on a tour to Europe, visiting the institutions for technical education, and the great ship-yards, and returning in time for the opening of the new college year. The principal is also to be professor of marine engineering, and there is an assistan professor of naval architecture. The indications are, that for next year, the number of students will be as large as can be accommodated. The course of instruction covers three years, the first year being the regular senior year of the academic course with special technical studies; in the second and third years the study is still more specialized, the instruction, will be complete and embrace the whole range of theory and practical design in connection with naval architecture and marine engineering.

PORT DUES.

The master of the Canadian steamer St. Magnus brought up a fine point in the Duluth custom house on Friday afternoon when they called for clearance papers. Canadian vessels sailing into American ports are taxed 3 cents a ton, a maximum of five different times annually, or 15 cents a ton in all for the season. The St. Magnus cleared for Duluth from Montreal and stopped at Detroit on her way up for slight repairs. Here she paid her first 3 cents a ton. When she called for clearance papers at Duluth it was a puzzler to the customs officers whether she should be called upon to pay another 3 cents, having originally cleared for Duluth. It could not be decided and Collector Johnson left the matter in abeyance until the secretary of the treasury could be communicated with although it would seem that the five payments only were necessary for the season and these might be paid either at Duluth or elsewhere.

CANADIAN HARBOR IMPROVEMENTS.

The appropriations for 1893, as reported to parliament, include the following items for rivers and harbors in Ontario: Trenton harbor, dredging, locality providing $2,000, $3,000; Belleville harbor works, the local authorities furnishing $2,000, $3,000: Toronto harbor, works at eastern entrance, etc., the city of Toronto having contributed $100,000, $75,000 Owen Sound harbor, dredging, $15,000; Port Albert repairs to north pier and towards extension of piers and dredging, $8,000; Goderich harbor, dredging, $15,000; Rainy river, improvement to Long Sault rapids, additional amount required, $2,200; River Beaudette, improvement of river by cleaning out channel, $5,000; Port Rowan, wharf, $6,000; Midland harbor, dredging, $2,500; Penetanguishene, dredging, $2,500; Port Arthur, dredging, $5,000. The total amount for Ontario is $142,200.

THE TIOGA CASUALTY AGAIN.

The Union Steamboat Company and the Genesee Oil Company are soon to face the ultimate consequences of the disastrous explosion in the steamer Tioga at Chicago two years ago. Seventeen actions have been brought in the supreme court by the service of summons on Joseph and William H. Bright, of the steamboat company, to recover damages for $5,000 in each of sixteen cases for the death of the plaintiff's intestates and for $10,000 in one action for the plaintiff's injuries resulting from that explosion. The papers in the cases set forth the circumstances of the explosion of naphtha stored in the hold of the Tioga, which, it is charged, had been shipped by the Brights as "oil" contrary to law, and the steamboat company is charged with not having used proper care in ascertaining the true nature of the same.

TREATISE ON STRUCTURAL STRENGTH OF IRON AND STEEL SHIPS.

BY JOSEPH R. OLDHAM, N. A., CLEVELAND, O.

[Continued.]

I have endeavored to show that it is quite possible, and even practicable, to reduce the depth of our Lake steamers to reasonable dimensions, with a gain in dead-weight ability and a reduction in first cost, whilst at the same time retaining ample longitudinal strength and freeboard, it may now be convenient to take a further step and describe what I consider the most useful feature of my system. My ideal cargo steamer would be one with a hatchway extending over the full length and breadth of the freight hold, so that the vessel would be ready for work, under any chutes or hoists, without time being lost in adjusting the centre of hatchways to the land gear. But though this may be accomplished, it could not be done in a sea-going steamer of ordinary design, without causing her to be very heavy, and probably somewhat unfit to face a great storm, but I think it may be possible to approach this desiderata without difficulty or danger, and I venture to submit, the annexed prints as an illustration of an improved general cargo boat, under present conditions of sailing, loading and discharging.

By the arrangement of topside girders, I may make my hatchway of almost unlimited length, but so as to keep down the weights of these girders, I have placed semi-box beams 24 feet apart, (a combination which gives a much stronger deck, and topside, than any ordinary steamer possesses) but this, and the possession of enormous hatchways, is not the sole advantage resulting from the adoption of these strong box girders, for as some of you may know, I have all along maintained that our typical large lake steamer, is too high for any such drafts of water as obtain in a general lake trade. This is some times admitted by our shipbuilders and others, who say in extenuation, that they cannot well reduce the height or depth of their boats without weakening them, and this is generally true, as ordinary steamers are at present constructed.

Professor Mosely remarks on the condition of maximum strength with minimum weight, that the strongest form which can be given to a solid body, in the formation of which a given quantity of material is to be used, and to which the strain is to be applied under given circumstances, is that form which renders it equally liable to rupture at every point. So that when, by increasing the strain to its utmost limit, the solid is brought into that state bordering upon rupture at every point.

Now, bearing this in mind, I have endeavored to so place a given amount of material in this design so that no one point may be more liable to rupture than another.

Now, as I have shown you that there is in all beams or girders a neutral plane, and at the axis there is practically no weight of material required, to resist either a compressive or a tentional longitudinal strain, and so if a steamer be looked upon for the moment, as a huge girder or beam (in one sense she may certainly be so considered whilst upright without material error) it should seem that we can afford to dispense with a great weight of material, that is now commonly to be found in the location of the neutral surface. The foregoing sketch may serve as an illustration of what I mean: For at the point A there can be no stress when the girder is at work, and so in my vessel, I take many tons of metal away where it will not be required, as I construct her, and add a very few tons to give increased longitudinal vertical and longitudinal horizontal strength and stiffness.

I here aver that my steamer, whilst fully twenty per cent. lighter than our ordinary steel steamers, will be at least as strong, and that she will not cost within twenty per cent. as much money.

As regards that bug-bear of "not looking nice," I will be glad to learn in what respect she is not "shipshape and Bristol fashion." Of course, I mean with the exception of the stack, but that is no part of my self-trimming arrangement, and as to it, I may say that if you pay a lot of money for mechanically forced draft, and still more money and time in keeping it up, you may even then derive a benefit, but be that as it may, if my stack will give me an equal induced air pressure, without any expenses for keep up, and about the same in first cost, I can easily afford to be laughed at for a time, on the ground of carrying a lofty mast up from the stokehold, but let me say that square sails have been hoisted up on high smoke stacks, before the writer saw the light of this our day.

With reference to thin topsides, I have heard it maintained by no mean authority that the bottom, when strained, does not transmit such strain to the topsides, at least so severely as to cause rupture there, even when the bottom is so effected.

Now this may be true, but it is only partially true, for though in cases of grounding the flat of the bottom may be locally compressed to destruction, and the topside remain uninjured, yet this is only the case when such pressure is endured, by the flat of the bottom, for when such is the case the strength of the frames and floors are inadequate to transmit such strains to the vertical sides, hence the topsides cannot be but slightly stressed.

But, as such conditions do not obtain in a seaway, nor in deep water, it should follow that the results would then be different, and so they are, for I have seen many vessels, even with weak bottoms, show severe straining on their topsides after encountering a severe storm, and heavy sea, whilst the bottom

and bilge remained quite uninjured, and without showing any signs of distress.

Let me here just remind you that the bottoms of our ordinary lake steamers are comparatively light, I do not say too light, but they are much lighter and weaker, if you like, than any vessels of like sizes built to Lloyds' rules.

And so when we express misgivings as to the strength of our topsides, understand that we are not thinking of damage from ordinary stranding, but from such stresses as our vessels may be subject to, in a seaway when deeply loaded. In our lake trade I am convinced that when designing and constructing our steamers we should make provision for repairing bottom damage by stranding, economically, and the topsides should only be fortified, against "afloat" strains, for in cases of sudden and sharp pressure there is little or no chance of the bottom conveying a breaking strain to the gunwale.

Let me here premise that the longitudinal stresses as shown by the annexed calculations will only thus be felt at the gunwale while the vessel is in the upright position, in vessels having very round sides, (that is, convex sides) the severest stresses may be experienced about the very locality of this neutral axis, when the vessel is lying over on her beam ends. I have therefore provided for exceptional contingencies by placing a good strong girder about half way between the bilge and gunwale: In these calculations, Mr. Fairbairn, Mr. Mansel, and Mr. Laurie all treat a ship as if she were a beam or girder, and, as I have said, it is a proper method of analysis, and one that gives invaluable information to the naval architect, but I must here admonish young shipbuilders not to be misled by accepting results arrived at by this formula as being comprehensive of the varied stresses to which ships are subject in a heavy seaway, for bear in mind, that though the ship may often be called upon to do such work as a girder bridge, the bridge is never required to do the duty of a ship in a seaway, for though that bridge is perfectly safe for carrying that loaded train, it is only safe by virtue of its upright position.

Let the bridge roll only a degree or two out of its original vertical position, and disaster will immediately follow.

You see that though such calculations as I produce are well worth careful study and constant application, yet the scientific shipbuilder will always extend his calculations to embrace transverse stresses and longitudinal strains, both vertical and horizontal, when the vessel is lying over at angles of various degrees of inclination, as well as in the upright position. I have long looked upon the stringer or shelf plates as the portion of a ship which receives the most severe stresses, and if that has been so generally in the past, it will most certainly be so on these lakes for the immediate future at least, for a good practice has recently come into force (initiated by Capt. McDougall, I think) of having no protection of the sheer strakes or shell plating above the upper decks, and of course where the sheer strakes stop below the stringer plates the latter will take the initial stresses before the sheer strake, except when the vessel is heeling largely, at which time the junction between these two strakes of plating will feel the work most severely; therefore, I would recommend that the gunwale angle iron in its new position, be made larger than is common, and be double riveted in both flanges.

You know it is only by adding strength in this way, where the initial stresses may be felt that we can afford to reduce thickness over the great body of the vessel.

With reference to strength of materials: Mr. John Grantham, C. E., describes some very useful experiments made by Fairbairn and Barlow as to the relative strength of pine and wrought iron. By these we find that the relative power of wrought iron and pine is as 16 to 1 in favor of the former and that the power to resist compression or crushing, is, as 1 to 13 in favor of iron. Timber when wet, is crushed with half the weight which it will sustain when dry. Mr. Fairbairn's experiments on the relative power of iron plates and timber planking to resist fracture from a bluntly pointed body pressed upon it, corresponding to the effect produced when the vessel rests in taking the ground, on a round stone, or other similar hard bodies, are interesting.

A plate was stretched firmly on a frame having an opening of twelve inches square, a bolt terminating in a hemisphere of 3 inches diameter was then pressed perpendicularly on the centre of the plate.

In the first experiments the plates were one-fourth of an inch thick, and were indented about a quarter of an inch with 9,700 pounds, and cracked through with a mean pressure of 16,779 pounds. On the experiments being repeated with plates one-half inch thick, they bore a mean pressure of 37,723 pounds, or little more than double the former, or nearly in proportion to their thickness. With experiments on timber conducted nearly in the same manner, the ultimate strength of an oak plant 1½ inch thick, was 4,406 pounds and of a plank 3 inches thick, 17,933 pounds, or as the square of the thickness. Such experiments as these should tend to show that wooden decks add little or nothing to the longitudinal strength of ordinary steel ships.

Too much care cannot be taken to bring all riveted surfaces absolutely close together, and to attain this, the burr, round rivet holes, or other rough surfaces should be carefully smoothed off, otherwise the rivets may be subject to an irregular shearing stress when such stress might all be borne by the resistance due to the friction between the surfaces. Mr. Edwin Clark, Resident Engineer, of the Britannia Bridge, made some interesting experiments to ascertain the amount of friction due to contraction by the cooling of rivets. Three plates were brought together, each outside plate had a circular hole in which the rivet fitted exactly, but in the centre one the hole was oval, or 2½ inches long for a ⅞ rivet, and the rivet was not allowed to touch either end of this hole; a strain was then put on the centre plate till it began to slide, which it did abruptly. Several trials were made, and the least result was a friction equal to 4½ tons with a ⅞ rivet. He also showed that if a rivet were closed at a temperature of 900 degrees it would exert a power in cooling much exceeding its own strength, and it must therefore become permanently elongated, and maintain a constant pressure at the head, equal to the full strength of the bar, or about twenty-four tons, and the friction of the plates thus closed would have to be overcome before the rivet came into action as a mere pin. It is only by machine riveting that the temperature of 900 degrees could be maintained till the rivet is formed.

In the process known as chipping iron or steels on the inside, it is frequently the case that many shell rivet heads fall off. In most instances I am of opinion that such rivet heads were all but broken off when the riveting was just finished by severe hammering and sudden cooling, but, however that may be, I may say that so long as there are not many headless rivets in one strap or plate the danger of disaster suddenly following is quite remote.

[To be Continued.]

NEW EXPERIMENT IN STEAM PROPULSINO.

An interesting experiment is soon to be tried in England, says the "Scientific American" with a vessel provided with two screws which are arranged amidships under the bottom of the boat on plans invented by F. W. Richardson. A successful trial has been made in an old vessel, and now the company have intrusted the order to build a vessel specially adapted for the purpose. The vessel is to be fitted with two pairs of compound surface condensing engines. The tube in which the propeller works is a complete tube for about five or six feet, and then it tapers down to the keel, the forward end at eleven and the after at eight degrees. The advantages claimed by the patentee for this system of propulsion over the present stern propeller are as follows:

1. Economy of power, and consequently saving of fuel.
2. Direct action between the steam and the work.
3. Enormous reduction of weight in all moving parts, together with general lightness and compactness.
4. Variable immersion, so objectionable in the present system of propulsion, will not affect the principle.
5. Immunity from rocking and straining of engines.
6. Risk of fracture of crank or propeller shaft minimized.
7. Less noise and vibration, consequently a much more comfortable passenger boat.
8. When reversed the vessel will move straight astern without divergence.
9. No swell or side-work to destroy canal banks, owing to the currents moving straight astern.
10. By altering the relative speed of the engines, the vessel can be safely navigated in the event of rudder being carried away, or steering gear disabled.
11. Safety and steadiness in the event of the ship being hove-to, with perfect command under all situations.
12. War vessels can be built double ended, with power for ramming increased.
13. Greater facility for handling the ship, with full engine power for maneuvering.
14. Safety of the propeller power from harm.
15. Avoidance of risk of detention from accident and adjustment of the machinery for both screws at the same time.

THE ANCHOR LINE REACHING OUT.

The Anchor Line Co. are putting $1,200,000 into additions and improvements connected with their lake service, a large grain elevator with a greater capacity larger than any on the chain of lakes is contemplated by Manager Payne also an extensive new freight house. The Erie & Western Transportation Co. (Anchor Line) have no idea of getting left in the onward march of progression and with the three new steamers Codorus, Mahoning and Shuylkill added to the fleet the Reading combine may look out for aggressive competition. Erie is a less restrictive port than Buffalo—as Ashtabula is to Cleveland.

It cost the steamer John Owen $700 to reach a coal deck in the North branch at Chicago, to which she was consigned, as a result of the recent freshet.

The stage of water at Sault Ste Marie now is 14 feet 6 inches, just a foot higher than at the opening of navigation.

The barge Guiding Star was libeled at Ontonagon on Saturday for demolishing the eastern end of the new iron bridge at that port. The barge was being towed down the river when the accident occurred.

Changes are being made in the south dock of the Milwaukee Dry-Dock Co. to provide room for machinery for the construction and repair of steel vessels.

EXPERT WEATHER TESTIMONY.

If there is anything in the old adage that "practice makes perfect," says a writer in *Harper's Weekly*, Sergeant Dunn, of the Weather Bureau in New York City, ought to be nearly perfect as an expert witness on the weather.

Probably no lawyer in the city has so intimate an acquaintance with all the courts in town as the Sergeant is called upon to testify on an average of more than once every day in the year. His experience ranges from the district courts, where all the petty cases are tried, to the State Supreme Court, and he is often called to the United States courts.

The broad range of the suits in which he testifies is, in fact, quite marvellous. For example, the most common of the cases in which his services are needed are those resulting from accidents on slippery sidewalks, where a person slips on the ice and falls, and then sues the owner of the premises for heavy damages. Often the testimony of the clerk of the Weather Bureau in these cases, is vital, and sometimes practically decides the suit. The plaintiff perhaps broke an arm or a leg. The defendant gets the Sergeant to search the records; and possibly he finds that the weather had been so warm at the time and immediately preceeding the accident that it would be impossible for ice to have formed on the sidewalk. This testimony invariably has a strong influence on the jury, and the case often hinges on it.

Again, a merchant sues a warehouseman or a railroad company for carelessly leaving his goods out-of-doors in a storm so they are damaged. The defendent possibly gets the testimony of the clerk of the Weather Bureau to the effect that there was no storm while the goods were in his hands, and the council leads the jury to believe that the damage was done in consequence of the inherent defects in the merchandise itself. Such an inference is usually a strong argument in the minds of the jury.

Sergeant Dunn is often called as a witness in a class of cases which are of much more serious nature than those already mentioned. A good many of these arise from accidents in the harbor, where "weather' plays an important part. Not only are thousands of dollars' worth of property destroyed, but many lives are lost, and the question of criminal carelessness comes up. The result of a criminal prosecution against a pilot may turn on the testimony of Sergeant Dunn. The defendant swears that the day, or night, as the case may be, was rainy and foggy, and depends on the condition of the weather to excuse him from responsibility for the loss of life. He is a happy man if Sergeant Dunn corroborates him in this contention. He is correspondingly unhappy if the testimony of the weather expert is against him.

LAKE MARINE HOSPITAL SERVICE.

Dr. Walter Wyman, Surgeon General of the Marine Hospital Service, has made public the contracts awarded at the different ports for the care and sustenance of sick and disabled seamen, as follows:

Ashtabula.—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Henry Whelpley to furnish quarters, subsistence and nursing at $1 per day, contagious diseases $1.50 per day; John Ducro & Sons to provide for the burial of deceased patients at $14 each. Patients requiring long continued hospital treatment will be furnished transportation to Cleveland.

Buffalo—The medical attendance to be furnished by a medical officer of the Marine Hospital (Sisters of Charity) to furnish quarters, subsistence, nursing and medicines at 80 cents per day, contagious diseases at $2 per day, and to provide for the burial of deceased patients at $10 each.

Cleveland—The medical attendance to be furnished by a medical officer of the Marine Hospital Service; the Cleveland City Hospital Association to furnish quarters, subsistence, nursing and medicines in the United States Marine Hospital, under lease of September 21, 1875, at 64 cents per day, the hospital to be kept in repair by the Association; Flynn, Neel & Froelk to provide for the burial of deceased patients at $7.95 each.

Detroit—Hospital patients to be cared for in the United States Marine Hospital; out patients to be treated at the Dispensary, No. 90 Griswold Street; F. G. Marshall to provide for the burial of deceased patients at $9 each.

Erie—The medical attendance to be furnished by an acting assistant surgeon; Hamot Hospital Association to furnish quarters, subsistence and nursing at 71 cents per day. Patients requiring long continued hospital treatment will be furnished transportation to the United States Marine Hospital at Detroit.

Milwaukee—The medical attendance to be furnished by an acting assistant surgeon; out patients to be treated at No. 154 Wisconsin Street; St. Mary's Hospital to furnish quarters, subsistence, nursing and medicines at 80 cents per day; George L. Thomas to provide for the burial of deceased patients at $16 each. Chronic hospital patients to be furnished transportation to the United States Marine Hospital at Chicago.

Port Huron—The medical attendance to be furnished by an acting assistant surgeon; Hospital and Home to furnish quarters, subsistence, nursing and medicines at $1 per day. Patients requiring long continued hospital treatment will be furnished transportatton to the United States Marine Hospital at Detroit. George Thompson to provide for the burial of deceased patients at $8 each.

Sault Ste. Marie—The medical attendance to be furnished by an acting assistant surgeon; Mrs. Annie McNeely to furnish quarters, subsistence and nursing at $1 per day; J. Vanderhook to provide for the burial of deceased patients at $8 each.

Toledo—The medical atttendance to be furnished by an acting assistant surgeon; St. Vincent Hospital to furnish quarters, subsistence, nursing and medicines at 80 cents per day, contagious diseases $2 per day, and to provide for the burial of deceased patients at $15 each.

The Marine Record,

ESTABLISHED 1878.

Published every Thursday, at 144 Superior Street (Leader Building,) CLEVELAND, O.

IRVING B. SMITH. }
CAPT. JOHN SWAINSON. } - - - Proprietors.

BRANCH OFFICE.
CHICAGO. ILL., - - - 35 Franklin St.
THOMAS WILLIAMS, Associate Editor.

SUBSCRIPTION.

One copy, one year, postage paid, - - - - - - $2 00
One copy, one year, to foreign countries, - - - $3 00
Invariably in advance.

ADVERTISING.

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CLEVELAND, O., JULY 7, 1892.

CAPT. GEORGE P. MCKAY has just recovered from an attack of sciatic rheumatism after being two weeks under the weather. All are pleased to see the energetic vessel manager around at business again.

THE Baker sub-marine boat is another departure in the annals of marine architecture which must be credited to the Great Lakes. Whalebacks, monitors, straight backs and submarine vessels are special types invented and constructed on the lakes and the field is still being canvassed on other new patents and designs.

THE photo-gravure of the freight-monitor Choctaw presented to our readers with this issue, is taken from a painting by the rising young marine artist. Howard Sprague, and is the work of the Chicago-Photogravure Co. Any of our friends desiring extra copies of this supplement may obtain same at cost of ten cents each.

AUSTIN CORBIN, the New York banker, is ready to build a fleet of trans-Atlantic steamers to cross the ocean in five days. Mr. Fryer, inventor of the Howard Cassard, is willing to guarantee a four days' trip when he gets his vessels and her machinery just as he wants them. With these and other projects in the field, it is more than probable that a line of steamers under the American flag will soon be plowing the waters of the North Atlantic:

THE recent casualty to the Atlantic liner City of Chicago is to be deplored, yet, the first thing to be done after getting her afloat again is to learn why she was put there. Vessels do not usually strand of their own volition and each casualty ought to be made to teach a special lesson to those, who, for the time being, are running clear. No doubt a full and exhaustive inquiry will reveal the exact circumstances leading up to the beaching of such a fine passenger steamer.

A LAKE NAVAL RESERVE.

The United States is acquiring a navy, but how about the men to mann it, and from what source is it expected to recruit the ranks. The land forces are well organized, and a call to arms would meet with a ready response from the State troops, but if it was necessary to mann a naval ship without drafting from the crews in service, we venture to say that the scum of the universal floating population would have to be drawn upon by and through the direct influence of the filthy lucre, as opposed to the hearty co-operation engendered by a spirit of patriotism and love of the flag under which they were serving.

The naval reserve forces already organized in the Eastern States have prospered and there is no reason why the principal lake cities should not contribute their quota in this respect to the State and National defenses.

As the corps would represent a naval auxiliary there can be no good reason why the Navy Department should not send out a special officer to acquaint those who are or would be interested in such a movement with its practical workings and requirements and see that the preliminary steps were taken to organize wherever sufficient encouragement was met with. There is little doubt but that five battalions could be got together to represent the Great Lakes, the whole forming a squadron of 1,500 to 2,000 men of the best possible calibre whose ranks would o be added to, that in a few years the defense of the lakes would be eminently taken care of by the reserve forces under the supervision of several good naval officers.

OFFICERS' CERTIFICATES.

A license or certificate of competency granted to an officer of the mercantile marine by Federal authority, empowering him to sail in an American vessel, ought to be inclusive enough to allow him to prosecute his calling in any waters and under any rig—or tonnage—according to his qualifications.

The Great Lakes now produce a class of marine engineers of which any nation might feel proud. The capabilities of these officers are beyond question, and much of the credit awarded to the advancement of the lake marine is due to the skill and energy of the men who control the high-classed engines and machinery placed on the modern tonnage, and which is being regularly added to in the form of auxiliaries, for saving labor and to expedite the handling of ship and cargo.

Deck officers are also men of more than average skill and intelligence, and are rapidly forging to the front as members of a profession which can be acquired only after years of training.

With such a showing it is difficult to understand why the Supervising Inspector General of steamships cannot form a code of examinations so as to entitle an applicant to obtain an engineer, pilot or navigator, licenses for lake coast and ocean. The present one-sided system debars them from doing this and works derogatory to the best interests of the vessel owner and will be more markedly, so in a few years hence if there is no change brought about in the method of issuing licenses. Granting that the majority of lake officers would not be candidates for this inclusive coast and ocean license, nor would the officers regularly employed on salt water care to qualify for lake honors, yet, the way should be open to those desiring to prove superior qualifications in the dual capacity of piloting and navigating in American waters, and the tests might be easily and readily applied at any port where inspectors issue licenses.

Owners desirous of sending their steamers to the toast (and several are thinking about taking such a step) will find out that their trusted employes are ruled out as being incompetent, their engineers are not even permitted to qualify, nor can the masters be recognized as eligible candidates for examination by the local inspecters, no matter how competent they may be. To overcome such a singular state of affairs engineers' licenses might be graded and the qualification be based not upon the size of the boat or her machinery, but on the actual skill and knowledge of the candidate, the acquirements being such that an engineer is proved capable of handling his engines either on the lakes, coast or ocean it is unreasonable to hold that he is only capable of taking charge of an engine with cylinders of certain dimensions, and not of a similar, though perhaps a little larger engine or steamer, and only on fresh but not on salt water, either he is a qualified marine engineer or he is not entitled to hold only a limited specified license. No officer should be ruled out of aspiring to all of the honors granted by the licensing power of the United States, even to obtaining an unlimited license for locality, size of engines or boat.

The same argument holds good for the deck officers, who, on proving their qualification and service in American vessels ought to be entitled to hold license to sail in any waters. There are officers now sailing on the lakes who are eager to have their capabilities tested and if found duly qualified to perform the service required they ought to be entitled to hold a license certifying to their ability as engineers, masters, pilots or mates for both lake and ocean service.

THE FREIGHT SITUATION.

The Ashland rate is off to $1.10 and brokers put in a number of boats at that figure to get them in out of the wet, with the fear that the rate will go lower before the week is out. Brokers were yesterday trying hard to get 75 cents from Escanaba, but did not succeed in getting it. The Marquette rate is 95 cents. Coal rates are unchanged at 45 cents soft and 35 cents on hard coal to the head of Lake Superior, 60 cents to Chicago and Milwaukee, 50 cents to Manitowoc, 40 cents to Escanaba, Gladstone, the Straits and Lake Huron ports and 35 cents to the rivers. Lumber freights are unchanged.

WORK OF A LAKE SHIPYARD.

When the six boats now under way at Davidson's West Bay City shipyard are completed Capt. James Davidson will have turned out at that place forty-eight craft, twenty-three of which are steamers, seventeen schooners or tow barges and eight tugs. The first vessel was the Kate Winslow, built twenty yerrs ago. The list, exclusive ot three steamers, two schooners and one tug now under way and not named as yet, is as follows: Steamers—Oceanics, Siberia, George T. Hope, Australasia, Roumania, Bulgaria, Germanic, Brittanic, Geooge G. Hadley, S. S. Wilhelm, Majestic, Alex. Nimick, John Harper, Walter Nail, Lizzie Madden, Panther, City of Berlin, City of Paris, City of Glasgow and City of London. Schooners—E. M. Davidson, Laura Bell, Kate Winslow, Polynesia, John Shaw, Mary Woolson. Mary B. Mitchell, Tokio, Adriatic, Baltic, Atlanta, Nirvana, Celtic, Harold and Wahnapitae. Tugs—W. H. Alley, Temple Emery, Washburn, C. B. Strohn, Geyser, Andrew McLean and Maxwell A.

LAUNCH OF THE SCHUYLKILL.

The Anchor Line steamer Schuylkill was launched from the yards of the Globe Iron Works Co., on Saturday at 3 p. m. E. T. Evans, of Buffalo, manager of the Line to which the Schuylkill, Cordorus, and Mahoning are an addition, was prevented by pressure of business from witnessing the launch. The steamer was christened by Miss Nellie, daughter of Mr. Joseph R. Oldham, the well known marine expert, who had superintended the construction of the steamer for her owners.

The Globe Iron Works Co. have given the Schuylkill a sheer. The Mahoning and Codorus, the other two new boats of the trio, are built rigidly according to contract, that is sheerless, or as the term is now used "straightback" and this, taken in connection with the necessary rise in the deck plan, gives them an apparent "drop" at either end, the effect of which is far from pleasing. The "Globe" have given the Schuylkill sufficient sheer not only to overcome this apparent defect, but to give her a handsome model. She will, therefore, carry off the palm as to beauty, and also her builders have carried out in her the new idea that greater results are being obtained from the steam supply than from the size of the cylinders. The Schuylkill's engines are smaller than those in the other two boats, but her boilers are larger.

The Schuylkill is 293 feet in length over all, with 275 feet keel, 40 feet molded breadth, 26 feet depth. Her displacement at 16 feet is about 4,400 tons, and her carrying capacity on the same draft about 3,000 tons. Her propeller is 13 feet in diameter, with 15 feet pitch, and it is operated by a triple expansion engine with cylinders 20, 33, and 52 inches in diameter, by 42 inches stroke. Steam will be supplied by two boilers tested to 160 pounds pressure, 14 by 12½ feet, each boiler being provided with three 46 inch furnaces. The power is expected to drive her through the water, when loaded, at the rate of about thirteen miles an hour. There are six large cargo hatchways, eight water-tight gangways, and improved machinery and appliances for the rapid and economic loading and discharging of general cargoes or wheat. There are six water-tight bulkheads and a continuous double-bottom, forming water ballast tank 3½ feet in height. The steamer is supplied with all the modern labor-saving appliances, and with roomy quarters for officers and crew. Captain John Doherty late of the Anchor Line steamer Alaska will take charge, John E. Jordan chief engineer and James Niland chief mate.

AN AUTOMATIC CARGO SHOVEL.

The Thew automatic cargo shovel for trimming and discharging bulk cargoes and especially adapted for iron ore is now on the market and pronounced by expert engineers as being a most valuable labor saving device. Two of the shovels have been built at the works of the McMyler Manufacturing Co., Cleveland, O., and they will be placed, at an early date on a steamer trading between Two Harbors and Lake Erie ports.

The automatic trimming shovel was illustrated in these pages last winter, with a complete description of the work which it can accomplish, and although the shovel was ready for shipment and work at that time, the inventor desired to make some further improvements in simplifying its movements before placing it on board steamers. This work has now been done and traveling along the deck beams, the shovel, which is in the form of a large iron bucket trims and discharges with ease and rapidity.

Interest has already been manifested in this invention by lake vessel-owners, and it would not be surprising to find them being fitted on a large number of ore carriers.

COMMENDABLE GENEROSITY.

Capt. John Prindiville tendered the Waifs' Mission and Training School of Chicago, the use of the steamer Chief Justice Waite for an excursion to the boys. Supt. T. E. Daniels of the mission wrote the captain thanking him for the kind offer and accepting it for an excursion to be given the mothers and babies, saying the boys had just had a fine outing, and that a lake ride for the worn-out mothers and the little tots would prove the greatest benefit that could be conferred at this time. Capt. Prindiville then notified Supt. Daniels that the change was agreeable to him, and that the steamer would be at the disposal of the mission on the morning of Tuesday the fifth, that she would leave the wharf in the basin at the foot of Van Buren street at 9:30 o'clock on Tuesday morning. At Capt. Prindiville's suggestion, several Board of Trade gentlemen contributed toward a fund with which a lunch was provided for the excursionists.

STEAM VESSEL INSPECTION.

The following is a list of steamers enrolled in the Buffalo district whose certificates of inspection expire on the given dates:

July 17, Huntress.	July 17, Eber Ward.
July 17, E. C. Maytham.	July 5, Nebraska.
July 27, Oceania.	July 29, H. E. Packer.
July 30, I. C. Reynolds.	July 31, Northern King.
Aug. 10, Tacoma.	Aug. 14, Scranton.
Aug. 19, Clyde.	Aug. 27, Grand Traverse.
Aug. 28, E. S. Tice.	Aug. 31, Pier.
Aug. 31, Northerner.	Sept. 2, Fred Mercur.
Sept. 9, Hiram W. Sibley.	Sept. 22, R. A. Pecker.
Sept. 30, Oneida.	Nov. 9, City of Buffalo.
Nov. 25 Pentagoet.	Nov. 30, W. I. Babcock.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

The schooner I. M. Forrest, arrived here Wednesday morning June 29th with lumber from Charlevoix, her first trip after having received a $4,000 rebuild at H. B. and G. B. Burger's shipyard Manitowoc. Captain Otto Westerholm feels proud of his new purchase since her rebuild, and would have felt much better pleased if she had not got into a tangle with a steamer when going up the south branch of the river to unload, and had her main rigging carried away.

The Union Line steel steamer Tioga, Captain Phelps, in tow of the tug G. W. Gardner going up the south branch of the river at 9 o'clock Thursday morning collided with South Halsted street bridge, knocking it entirely off the wheels and turntable on to the bridge pier, one end falling on the tug Gardner and smashing her pilot house and cabin, smokestack, whistle, steam-pipes and exhaust and shifting the boiler and crushing several stanchions and stringers and some rail holding the tug under it until towards evening when the bridge was sufficiently broken up by a large crowd of workmen to allow of her being extricated. Very fortunately no one was injured, the crew of the tug were badly scared, Captain Cullnan threw himself down on deck and lay prostrate to escape being scalded, engineer Chas. Sheever and fireman Edward Beard jumped overboard and steward R. Davis and the linesman stayed by the boat, the steward going into the engine room and shutting off the engine. No blame can be attached to the captains of the tug and steamer as they were signalled to come ahead by the bridge tender who did his best to open the bridge but failed to do so in consequence of its being badly out of order. A large gang of men worked on the bridge all Thursday night pulling it to pieces and by 7 o'clock Friday morning both draws were open for navigation. Twenty-two hours were wasted by a large fleet of steamers and sailing craft, and the city authorities should be made to pay for their delay as well as for the bridge which has long been an old tumble down concern and should have been replaced by a new one long ago. The money wasted by the authorities in building Canal street bridge and some other useless bridges would have built an excellent bridge at South Halstead street where one is badly required.

Fitzsimons & Connell, are at last working in earnest, removing the cofferdam between Van Buren and Jackson streets, their workmen are pulling out the piles as speedily as possible, and it is probable that by next week another nuisance will be removed from the Chicago river.

The L. V. T. Co., owners of the steamer Seneca, last week libeled the tug Robt. Tarrant, in the United States District Court for $2,700 damages. They allege that whilst the Seneca was unloading Sisal at the Rock Island docks the tug came along and threw out a shower of hot cinders and set the Sisal on fire. Hence the action.

The schooner R. Hallaran went from Escanaba to Manitowoc last week in tow of the tug Delta, and was put into Burger and Burger's dry dock, and received some new keel forward and caulking.

The schooner Maggie Dall received a new mainmast at this port.

The following gives the arrivals at this port for the past six months of this year, also those for the same months last year:

	1892		1891
January	17	January	11
February	16	February	12
March	25	March	12
April	525	April	403
May	1,180	May	1,267
June	1,250	June	1,364
Totals	3,013	Total	3,069

There was a great demand for lumber carriers on Saturday, and more freights were offered than tonnage on hand. There were also urgent orders for vessels from Cheboygan, Oscoda and other Lake Huron ports, also from Ashland and other Lake Superior lumber shipping points. No advance in figures was established, but it is anticipated higher rates will soon rule. It is only right that they should do so, as vessel owners cannot continue much longer to run their vessels without a reasonable profit.

Shipping Master Biemel is shipping a large number of men, and he insists that the disposition of his case by the Desplaine Street Police Court, he being honorably discharged, confirms his right to carry his billy and his two revolvers, as many revolvers as he sees fit for that matter. During the trial President Elderkin of the union said he was afraid of Biemel, and asked that Biemel be bound over to keep the peace, and Justice Woodman refused to put the shipping master under bonds. Biemel showed a letter from the Secretary of Police announcing that he was regularly sworn in as a policeman and given a star, and had the right to go armed as a regular patrolman,

The steamer Nahant, Captain Jones, has had a two weeks' siege at this port, trying to get her cargo together. The City of Paris was the next longest delayed steamer. The Bradley Line steamer Hesper reaching here just after the current had subsided on Saturday received excellent dispatch, as in about 30 hours she discharged 2,500 tons of ore at South Chicago, reached this port same day, and loaded 76,000 bushels of corn for Buffalo. The question of dock facilities and prompt dispatch is becoming a serious one at this port, and is a matter that will soon have to be taken vigorously in hand or owners will again be giving orders to charter their tonnage for any other port than Chicago.

WILLIAMS.

DETROIT, MICH.

Capt. McKay, of the Greyhound, was before the United States commissioner Friday to answer to a complaint made by Canal Superintendent Mott for passing a steam-barge going in the same direction through the St. Clair flats canal, but according to the testimony of Capt McKay and his wheelsmen the Greyhound had reached the upper end of the piers before attempting to pass the barge, and it was necessary to increase the boat's speed at that time and place to keep her from sagging onto the crib work at the head of the west pier. As no one appeared to testify for the prosecution the case was postponed for a week.

Manager Ballin, of the Detroit Boat Works, who designed and superintended the construction of the Baker submarine boat, says the experiments so far have been entirely satisfactory to the government. Commander Folger, who recently inspected the boat, is interested in it, and there are reasonable assurances that the navy department will shortly place orders for the construction of some of the boats. Regarding the controversy over the electric battery which furnishes the motive power for the boat and the explosion of hydrogen gas that recently occurred in it Manager Ballin said: "George C. Baker inventor of the wheels for raising and lowering the boat, which is the only thing about it covered by a patent, is not a mechanic himself and left all the details of designing to me. He bought the motor from an Indianapolis Co., and the Woodward battery from Darius Avery through H. H. Humphrey. I warned Humphrey that the cells would generate hydrogen gas in the boat and explode, but he ridiculed the idea and said no explosion had ever occurred from a storage battery. When the explosion did occur a few weeks ago from the exact cause which I pointed out, the battery was damaged considerably, if not ruined. Baker and I insist that inasmuch as the explosion occurred because Humphrey, in setting up the battery in the boat did not do as I asked him to do—fit in a rubber pipe to carry off the hydrogen gas—he, as Avery's representative, ought to repair the battery and make it good as new. This, he and Avery decline to do, but want to be paid for a damaged battery that, for all we know is of no value. Humphrey says the explosion occurred because the opening on the top of the boat was bolted down so the gas could not escape. If, as he told Baker and myself, no gas could possibly generate, it is not clear how the bolting of the top caused the explosion."

LAKE FREIGHT MONITORS.

The supplement presented to all subscribers with this issue of THE MARINE RECORD shows a new type of freight carrier designed and built by the Cleveland Ship Building Co. and known as the "monitor" style.

Glancing at the photo-gravure, the observer might for the moment imagine that the "whaleback" features predominated, but, beyond the large tumble home to the upper works there is no similarity, under water the "monitor" build is on the lines of the most efficient freight carriers on the lakes and it is chiefly in the ends and the deck plan that any difference exists.

The Choctaw is a sister ship to the Andaste and is the second of the monitor type built by the Cleveland Ship Building Co., to the order of the Lake Superior Iron Co., of which H. H. Brown is the managing owner. Their general dimensions are 267 feet keel, 38 feet beam and 22 feet 4½ inches depth of hold, the engines are triple expansion cylinders 17.29 and 47 by 36 inch stroke. Two Scotch type boilers 11 feet diameter by 12 feet long tested for 160 pounds steam, speed, 13 miles an hour light and 12 miles loaded, carrying capacity 2683 net tons on a draft of fifteen feet. The "monitors" are fitted with steam capstans and windlasses from the American Ship Windlass Co., Providence, R. I., the Williamson Bros., steam steerer, mechanical marine telegraph by Chas. Cory & Son, New York, the Wm. Powell Co., Cincinnati, sight feed signal oilers and the cordage outfit has been placed on board by the well known firm of Upson Walton & Co., Cleveland, O., every modern appliance to facilitate the handling of ship and cargo has been given this new type of freight steamer even to the Chase automatic fog whistle machine.

The keel for the third monitor has already been laid and the work of construction is well ahead her builders knowing that so economical a vessel in first cost and keep up will soon recommend the monitors to those who are engaged in the handling of freight on the Great Lakes and markedly so in the carriage of bulk cargoes.

NOTES BY THE WAY.

MORE VARIATION ON LAKE SUPERIOR THAN IS GIVEN ON THE CHARTS.

DULUTH, MINN., July 5, 1892.

Editor of the Marine Record.

I take pleasure in sending you a few "notes by the way," that may be of interest to ship masters.

Having adjusted a ship's compass on Lake Erie, for deviation, I wished to verify my work on the run up the lakes. Accordingly, at Fort Gratiot,, I requested the captain to shape his course strictly to that indicated by the chart, which he did.

On nearing Sand Beach, we observed that our course would lead us ashore, On again observing the dumb compass, I found the ship had the course indicated by the chart, viz. N. by W. while the ship's compass indicated N. ¾ W. as it should with ¼ point variation W., and no deviation, so that both compasses corresponded with the chart course, yet we were going ashore. On examining the chart, we found it out by ¼ point. It should be N. ¾ W. and not N. by W., as marked. Whence the magnetic course is N. ½ W. for compasses not deviated.

Again, on the run from Eagle Harbor to Lapointe, Lake Superior, distance about 135 miles, we were led to the right, or north about 3 miles. As this was the second time I had been led out to the right on that run, and by about the same amount, I set about looking for the cause. I first thought it might be due to unknown variation, but this was not likely, for the run was close to the land nearly all the way, so we might reasonably suppose that it had been correctly measured.

Then I examined the effect of the inclination of the geographical meridians, finding a tendency in that direction, though not nearly enough to make a departu e of 3 miles in 135. I next bethought myself of the fact that the magnetic pole being almost directly to the north of us, and only about half the distance to the geographical pole, that the magnetic latitude (which is measured by the "dip",) would be much greater than the geographic latitude, and as a consequence, the magnetic meridians would have much more inclination or convergency than the geographic meridians, and this I found to be a full explanation of our difficulty.

The mean magnetic latitude of the route from White Fish Point to Duluth, is not sensibly different from 77°, the sine of which is .9744. The difference of longitude between White Fish Point and Copper Harbor, Copper Harbor and Devil's Island, Copper Harbor and Lapointe, for all practical purposes, may be taken as 3°; then multiply the sine of the mean magnetic latitude by this difference of longitude, we hav .9744x3° =2°.923, or a little more than ¼ point for the indication of the magnetic meridians passing through the extremities of any one of the above three runs, the half of which, or a little more than ⅛ point, is a correction to be applied to either end of the run.

Now, as the compass always leads the vessel in a curve, the "loxodromic" curve so well known at sea, the direction the ship should have in shaping her course, is in the tangent of the curve, and not in chord of this curve, as given by the charts. And as, in north latitude, this curve is always convex to the south, the above named, must always be set off to the south.

That is to say, after modifying the chart course of any one of these runs, by the mean variation of the locality and by the deviation of ships compass, if any, make a further correction of a full ⅛ point, to the south, without regard to whether you are sailing easterly or westerly. This rule was tested by two large steel vessels only a few days ago, on the run from Keweenaw Point to Whitefish Point, both vessels making excellent courses, but a slightly greater offing at Whitefish Point than was necessary, showing that the correction of ⅛ point to the south might with propriety have been slightly greater.

Once more. There is more variation between the Apostle Islands and Duluth than the chart gives account of,—by at least ⅜ point.

This greater amount of variation was discovered by observing the "total error" between ships "compass course" and chart course, and deducting the known deviation of ship compass. In this manner, I found between 12° and 13°, whereas the mean variation for this locality as given by the chart is about 8°—thus giving say ⅜ point more variation on this run than shipmasters have allowed for,—and explaining why vessels have always so persistently made for the north shore.

The above error was found about half way between the Island, and Duluth, further observation was prevented by the intervening of clouds, the "dumb compass" with time azimuths of the sun being my means of observation.

H. C. PEARSONS.

THE statement of traffic passed through the Suez canal in 1891 has just been published; it shows the largest increase, both in number of vessels and tonnage, over the previous year of any year in the history of the canal. The figures are: Number of vessels 4,207, net tonnage 8,698,777. This exceeds the Sault Ste Marie canal traffic for the same year by 298,092 tons. In 1889 and 1890 the Soo canal tonnage largely exceeded that of the Suez.

The Detroit Dry Dock Co. will raise and repair the propeller Progress.

ATLANTIC LINERS, PAST, PRESENT AND FUTURE.

The record of the Teutonic gives an average speed in knots of 20.35 from Queenstown making the passage to New York in August last, of 5 days, 16 hours, and 31 minutes.

Notwithstanding the high speeds gained by several other of the present liners, vessels are now building to do even better, he Cunard Company having ordered two from the Fairfield Company, and the Inman Co. are also contemplating some new vessels, but no contract has positively been made as yet.

As to the size of the steamship of the future, financial considerations must determine it. Any addition to size means greater displacement and greater power to get a high rate of speed. A small craft, similar, perhaps, to a torpedo boat of the Thornycroft or Yarrow build would give results satisfactory at least on the debit side of the ledger, but what of the credit side, which, after all, is the more important in a merchant ship of the Atlantic greyhound type? In the case of British ships, there are only two sources of revenue—from passengers and for the transport of cargo and mails. In a vessel of the torpedo type there is not room for either. So also with high speed cruisers, where a very large proportion of the length, in some cases 40 per cent., is given up for machinery. Indeed, only in exceptional cases could a cruiser carry fuel to cross the Atlantic at full speed, and certainly no torpedo boat would essay to do so. In the modern high-speed passenger steamer the cargo capacity of the vessel is limited, and so valuable that only precious cargo is carried, and that at a pretty high rate. The cause of the limitation is the weight of machinery and coal, and the necessity for minimizing the displacement. To compensate for this decreased cargo capacity, and to meet the increased expense, it is necessary to secure a larger income, and it may be taken that this can be done more effectually by adding to the passenger accommodation rather than by raising the passenger fares. This means a great increase in the size of the vessels, for passengers cannot well be put below the level of the loadwater line. It is not necessary to enter into the relationship of power, speed and size of vessels. Atlantic vessels are built to comply with conditions dictated by financial considerations.

The engines of the City of Paris, indicating 20,000 I.H.P. weigh with boilers, water in same, and in condensers, 2,600 tons, while the engines of the pioneer vessel of the Cunard fleet, the Britannia, of 740 I.H.P., were only a fraction of this, probably not more than a tenth. The I.H.P. per ton is in the City of Paris 7.7, and in the Britannia about 3.5 or less. Although the first Cunarder would look diminutive beside the later craft, the newer vessel can carry very little additional cargo. The City of Paris requires to have 2,500 tons of coal in her bunkers against 600 in the Britannia, and that notwithstanding the former does not take half as long to cross as the latter.

The difference, financially, is made up in passenger accommodation. The City of Paris has carried 1,500, whereas the Britannia only took 115. In one of the leading Atlantic liners which has been mentioned, 80 per cent. of the income is derived from passenger service alone.

The leading builders do not consider that the limit of size has been reached, and, in fact, the present limit is in the docks; Mr. James Dess, harbor engineer at Glasgow, sets the example by constructing a graving dock with a floor 900 feet long, with a width at bottom of 74 feet, and at entrance of 85 feet, and capable of taking in a vessel of 26 feet draught.

As to speed, there is really no insurmountable difficulty in attaining 40 knots, but this would require something like 160,000 I.H.P., seventy boilers to generate the steam, and these would burn considerably more than 2,000 tons of coal per day. Some idea may be formed as to the size of the vessel necessary for this machinery. We leave it to the imagination of the reader.

CLOUDS AS WEATHER SIGNS.

The general cloud signs penned by the late Admiral Fitz-Roy, and still incorporated in the publications of the Meteorological Office, are useful guides to the ordinary observer. Light, delicate, quiet tints or colours, with soft indefinite forms of clouds, indicate and accompany fine weather; but gaudy or unusual hues, with hard, definitely outlined clouds, foretell rain, and probably strong wind. Small inky looking clouds foretall rain: light scud clouds driving across heavy masses show wind and rain, but if alone, may indicate wind only, proportionate to their motion. These and many other general rules have long been trusted, but it is only of recent years that much importance has been attached to the relative stratum of the atmosphere in which the clouds are moving. "It is now generally acknowledged," says the Nautical Magazine, that in cyclonic storm areas the wind at the earth's surface draws inwards towards the central area of the disturbance, and the clouds at a medium height in the atmosphere revolve in a true circle round the storm centre. whilst the higher clouds, such as cirrus, diverge somewhat from the center. The upper clouds in the front of a cyclonic disturbance also have a somewhat different movement relative to the center than the clouds in the rear of the storm's path; it will be readily seen that such observed facts are of the very highest importance to the weather forecaster on shore and to the sailor when in an isolated position.

MAKING CHAIN FOR THE GOVERNMENT.

In the manufacture of its own chains and anchors the United States Government claims to secure results otherwise unattainable on the score of strength and durability, even making its own iron, using nothing but the finest of malleable scraps, and the process is unique. The metal, as withdrawn from the surface a glowing white mass, is rolled into long flat slabs of about 1 inch in thickness, which are cut up into short lengths to be again subject to intense heat; these being withdrawn, are rolled into billets of a few inches square at the ends and about 2 feet long, which are now for a third time thrust into the furnace, and at a white heat are taken out by means of large tongs suspended by a chain from an overhead trolley wheel, then rolled quickly into rods of various sizes and a number of feet long, being allowed to cool gradually in the air. The rods are now cut cold into short lengths for the links, which are formed by again heating and placing upon a special contrivance and turned into a staple shape, the staples being then linked together, completing the chain, the ends welded together by hand, the joining piece then put on—the link being thus complete—so far as workmanship is concerned. To test the work, a long ditch running on one side of the shop is provided at one end with secure fastenings and at the other by a hydraulic engine, by means of which the chain is drawn tight and subjected to so many tons pressure.

LAKE ONTARIO PASSENGER SERVICE.

The steamers St. Lawrence, Islander, Maynard and Jessie Bain, of the Thousand Island Co., are now running in connection with trains on the Clayton and the Cape Vincent Bay routes. The New Island Wanderer has began her trips among the islands. The old Wanderer and the Massena ply between Ogdensburg and the Bay and the Sylvan Stream is running upon a new route from Ogdensburg to Clayton. The Bon Voyage, which earned a 20 per cent dividend for her stockholders last year, is the only steamer running from Charlotte and the river ports this year. She leaves Charlotte Sunday, Tuesday and Thursday evenings and leaves Alexandria Bay for Charlotte every Monday, Wednesday and Friday afternoon. The Richelieu & Ontario Navigation Co. are running the Spartan, Passport, Corsican and Algerian—on the Toronto-Montreal route. This company will put on a new boat after July 4. named the Columbian, built last winter by the Morgan Iron Works, of New York at a cost of $100,000. She is a twin screw steamer and will run between Kingston and Montreal. She will leave Kingston every Monday, Wednesday and Friday, so that there will be a boat to Montreal every day this summer and two boats down Wednesdays and Fridays.

INLAND LLOYDS' SUPPLEMENT.

Capt. Daniel McLeod, manager of the Inland Lloyds for this season, has issued the third supplement. It contains the names of six new steamers, one tug, one schooner and one barge built this year and enrolled during the month of June. They are as follows: the steamer Cadillac, built at Chicago for the Cleveland-Cliffs Iron Co., of Cleveland, valued at $120,000, the steel straight back steamers Codorus, Mahoning, and Schuylkill, built at Buffalo, Detroit avd Cleveland for the Erie & Western Transportation Co., valued at $175,000; the great steel steamship Maritana, built at Chicago for the Minnesota Steamship Co., of Cleveland, valued at $200,000, and the 2,200-ton steamship W. H. Gilbert, built at Bay City for the Empire Transportation Co., and valued at $225,000. The steamer Bon Voyage, built last year at Saugatuck, is newly enrolled. She is given an insurance valuation of $35,000, and is classed A1½. The tug Deer, measuring 25 tons, built by T, W. Kirby of Grand Haven, for himself, is valued at $11,000: the schooner J. S. Parsons, built and owned by F. Phelps, of Chaumont, measures 109 tons and is valued at $5,500, and thh barge Abram Smith, built at Algonac for Comstock of Alpena is entered as measuring 354 tons, and worth $18,000.

VACCINATION OF LAKE SEAMEN.

The surgeon general of the marine hospital service has issued a circular to medical officers and acting assistant surgeons of the marine hospital service serving in the districts of the Great Lakes and Ohio and Mississippi rivers in relation to the vaccination of crews of vessels on these waters. The circular says: "In view of the prevalence of smallpox in various places on the Ohio River and Great Lakes and the increase in the number of cases in various sections of the country, the bureau is called upon to render aid in preventing the further spread of the disease by vaccinating and revaccinating the beneficiaries of this service, who by reason of their migratory calling may not come within the jurisdiction, or may escape the surveillance of state and local health authorities."

The officers are directed personally, or through the detail of an assistant, to visit the vessels as they arrive in port if need be, and vaccinate the crews on board.

A SCHOONER is now being fitted out at Halifax to go to the Arctic regions to get ten or twelve Esquimo families, fifty or sixty persons in all, for exhibition at the World's Fair. Dogs, fishing implements, utensils and everything necessary to show Esquimo lite will also be secured.

DETROIT NEWS NOTES.

The Davis Boat & Oar Co., are crowded with work at their Wyandotte shops where they employ a force of 60 men, among their recent shipments are to be noted two boats to Guodalojara, Mexico, they have had several previous orders from Mexico and anticipate a growing order trade there. The steam yacht Catharine built by the Davis Boat & Oar Co., for Mr. Cudahy, of Chicago, has in every respect exceeded the expectations of the owners, especially as to speed. It is work of this class that is bringing the company into a conspicuous position among American builders of pleasure craft.

S. H. Davis' tug Fisherman, is being rebuilt at the yard of John Oades, the yacht Mabel owned by J. B. Bough, is being lengthened 12 feet at this yard and is to receive new engine, boiler and a Hodge wheel.

The engine building firm of Samuel F. Hodge & Co. will shortly begin erecting on recently acquired property adjoining their present works a mammoth foundry plant. It will be an iron structure from East Berlin, Coun., and all ready for erecting so that by fall it will be in operation, length of foundry about 170 feet.

T. W. Noble, the sail maker reports the busiest spring season he has enjoyed in the past ten years and is working a force of about 40 people. Among work in hand I noticed elegant outfits of sails, awnings etc, for Hopkins new yacht Bonito now building at Detroit and for a new yacht building at Alpena by Geo. E. Smith.

A NEW FUELING DOCK.

The sale of 600 feet of water front in the town of Sandwich, Ont., by W. G. Curry to Cleveland parties has been completed. John Mullen of Amherstburg acted for the Cleveland parties and Mr. Curry made the purchases from the several owners deeding back to the real investors The purchasers are Cleveland coal dealers who have noticed that since Smith & Co. commenced to operate a fueling dock near the mouth of the River Rouge the sales of coal at Cleveland and Amherstburg have fallen off, boats preferring to be as light as possible when crossing the Limekilns, hence it is the intention to open coal yards on the newly acquired property at Sandwich and they promise to be on an extensive scale, since Mr. Mullen says the chutes will cost about $30,000. The price paid for the property was $8,000. The location gives the required depth of water, or all the purposes of fueling and is in an exceptionally good location.

TRANS-PACIFIC TRADE AS A TRIBUTARY TO THE GREAT LAKES.

Mr. J. J. Hill, president of the Great Northern Railroad, has entered into an agreement with an English syndicate, whereby a Trans-Pacific Line of steamers will supply freight for his railroad across the continent to the head of navigation on Lake Superior. The Canadian Pacific Railroad Co. are also not a whit behind the times in keeping well in advance of commercial progression, and, not content with placing the splendid Empress Line on the Pacific they are now endeavoring, with every prospect of ultimate success, to connect with the Dominion government in placing a fast line of steamers to cross the Atlantic.

CANAL TOLLS.

The friction now existing between the United States and Canada relative to canal tolls is to be regretted, as both powers seem to be open to conviction that the course now being pursued by either is not the most righteous one possible towards the citizens of each country.

It is a foregone conclusion with Americans that unwarranted discrimination positively exists in the levying of canal tolls, but the Canadians will not admit such to be the case, nor is it likely that they will be convinced until the United States exacts a toll on Dominion vessels using the St. Mary's Falls canal.

A LAKE ERIE SURVEY.

The lake survey party in charge of Lieutenant Roche, corps of engineers, U. S. A. has finished its work on Lake Erie and disbanded. The results of the survey will appear in time in a corrected chart of the locality showing the dangerous rocks and shoals discovered in Pelee Passage and off Colchester which is one of the most frequented channels on fresh water.

THE Choctaw, second of the "monitors" built by the Cleveland Ship Building company for the Lake Superior Iron company, left port Saturday on her second trip. She is a sister ship of the Andaste, and made a splendid record on her first trip to Marquette, averaging about 12 miles an hour, her triple expansion engines working very smoothly and giving perfect satisfaction. Capt. Brown is in command of the Choctaw.

Maritime Law.

District Court, S. D., New York. April 14, 1892.

COLLISION—NARROW CHANNEL—TIDE—RIGHT OF WAY—WHEN DUTY TO STOP.

Where two tows are approaching each other in a narrow channel in such wise that by continuing on they will meet at a point where it is difficult and dangerous for them to pass, it is the duty of the tow going against the tide to stop before reaching such difficult point, and wait for the other tow to go by her.

District Court, S. D. New York, April 18, 1892.

SHIPPING—NEGLIGENCE—IMPROPER HATCH COVER—PERSONAL INJURIES.

Owing to the warping of their supports in hot weather, the hatch covers of a ship did not fit tightly over the hatch, which fact was unknown to libelant, who had recently shipped as sailor on such ship. In consequence of such defect, as libelant was under orders, covering the hatch, one of the covers fell, precipitating libelant into the hold. Held, that the ship was liable for his injuries.

Circuit Court of Appeals, Second Circuit. Jan. 18, 1892.

1. COLLISION—SAILING VESSELS MEETING—FREE AND CLOSE-HAULED COURSES—LIGHTS.

A brig and a schooner approached each other on a clear night, the brig sailing free on a course W. ½ N., and the schooner close-hauled on an E. by N. course. On conflicting evidence the court found that the schooner held her course, except for a luff *in extremis*, continually exhibiting to the brig her green light, and that the red light of the brig was seen on the schooner's starboard bow some time before the collision. The brig collided with and sank the schooner. Held, that it was the duty of the brig, sailing free, to have avoided the schooner, sailing close-hauled, and for her failure so to do the brig was in fault.

2. DAMAGES—EXPENSE OF RAISING SUNKEN VESSEL—WHEN NOT ALLOWED.

The mere fact of a vessel's sinking by reason of a collision is not sufficient to warrant a finding that she and her cargo are a total loss: and where it appears probable that they may be raised without much expense, and the vessel repaired, owners are not allowed to insist upon damages, as for a total loss, when they have not employed reasonable measures to mitigate the loss. But when a vessel worth $3,800 was sunk in deep water, and was afterwards raised at a cost of $1,900, and repairs were put upon her to the extent of $6 800, held, that the wrong doer was liable only for the value of the ship, cargo, freight, and personal effects on board before the collision.

33 Fed. Rep. 875.

District Court, E. D. Wisconsin, January 1, 1890.

SEAMEN—SALVORS—PRIORITY OF LIENS.

It is the duty of seamen to remain by the wreck of a vessel so long as their personal safety will permit, and save as much as possible from the vessel; and when they have done so the fragments of the vessel, and the outfit saved, constitute a fund pledged for payment of their wages, superior to the claim of the salvors.

In admiralty. Libel by seamen for wages. Intervention by salvors. Decree for libelants.

The facts in this case, as shown by the pleadings, were these: On the 15th day of October, 1879, the schooner Davidson left Chicago on a voyage to northern ports on Lake Michigan. The libelants shipped on board as seamen. On the next day the vessel was stranded on Pilot Island reef. On request for assistance from the master, Wolf & Davidson, of Milwaukee, dispatched the tug Leviathan with steam pump and other apparatus to the relief of the vessel. Efforts were made to get the vessel off, and were continued until November 26th, but unsuccessfully. From the time the vessel was stranded until exertions to relieve her were abandoned, libelants continued on board. On the 25th day of November, the master of the tug, being convinced that the vessel could not be relieved, deemed it advisable to save her outfit, consisting of boats, tackle, rigging, apparel, and furniture, and ceased his efforts in behalf of the vessel. Thereupon the master and crew of the tug, with the assistance of the crew of the vessel, removed the vessel's outfit to the tug, and brought it, together with the master and crew of the vessel, to the port of Milwaukee. Libelants were then discharged, but were not paid their wages, and thereupon libeled the outfit. Decree was rendered in their favor, the outfit sold, and the proceeds were paid into the registry of the court. Thereupon the owners of the tug intervened by petition, as salvors, insisting that their claim for salvage service was prior to that of the seamen, and asked for payment as having the prior right to the proceeds of sale.

DYER, District Judge. The seamen were not discharged from the obligation of their contract of service by the happening of disaster to the vessel. It was their duty, so long as their personal safety permitted, to remain by the wreck, and save as much as possible, and upon compliance with this obligation the fragments of the vessel constituted a fund pledged for payment of their wages; but upon abandonment by them of the wreck the contract between them and the owner of the vessel would be dissolved, and they would then lose their privilege against the vessel, and their claim for wages. As libelants remained by the wreck, and did not abandon it until the outfit was removed, their right to wages and their lien continued in force. Under the circumstances of the case the wages earned while they remained on board, and until the vessel was finally abandoned, did not constitute antecedent wages, in a sense which would postpone them to the claim of the salvors, and the proceeds of the outfit must be first applied to payment of their demands, although it would have been otherwise had they abandoned the wreck before the salvage service was begun.

EMMONS BLAINE, President and Treasurer.
WALTER F. COBB, Vice President.

W. I. BABCOCK, Manager.
O. R. SINCLAIR, Secretary and Asst. Treas.

Chicago Ship Building Company,

STEEL STEAM-SHIP BUILDERS.

101st Street and Calumet River, COLEHOUR, ILL.

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, Paid up in Cash, - - $3,000,000.00
ASSETS, - - - - - - 9,273,220.00

CHARLES PLATT, President. WILLIAM A. PLATT, Vice-President.
EUGENE L. ELLISON, 2nd Vice-President. GREVILLE E FRYER, Sec'y & Treas.
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ATLANTIC MUTUAL INSURANCE COMPANY,

(ORGANIZED 1842.) Office, 51 Wall Street, NEW YORK.

Insures against Marine and Inland Transportation Risks and will issue Policies making Loss Payable in England.

Assets over $10,000,000 for the Security of its Policies.

The profits of the Company revert to the assured, and are divided annually upon the premiums terminated during the year; thereby reducing the cost of insurance. For such dividends, certificates are issued bearing interest until ordered to be redeemed, in accordance with the charter.

J. D. JONES, Prest. W. H. H. MOORE, Vice-Prest. A. A. RAVEN, 2nd Vice-Prest. J. H. CHAPMAN, Secy.

ORGANIZED 1881.

Michigan Fire and Marine Insurance Co.,

CAPITAL, - - - - $ 400,000
ASSETS, - - - - - 900,000
LOSSES PAID, over - - - 1,500,000

D. WHITNEY, Jr., President. EUGENE HARBECK, Secretary.

This Company will transact a Hull and Cargo business on the Lakes during the season of 1892.

LOSSES PROMPTLY PAID. INSURE IN A STRONG HOME COMPANY. **DETROIT, MICH.**

CAPITAL $300,000.

The Marine Bank Company,

Incorporated in 1891 under State Law. CLEVELAND, OHIO.

Successors to E. B. HALE & CO., established in 1852.

DIRECTORS:

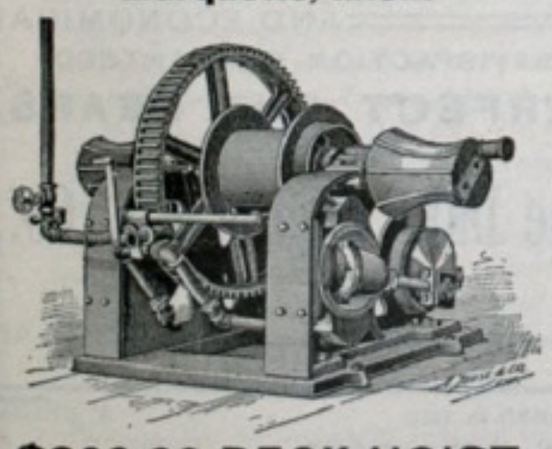
W. H. BARRISS, President. H. C. RANNEY, Vice-President. W. B. HALE, Cashier.
C. E. BURKE. THOS. FITZPATRICK. THOS. H. WHITE. MARTYN BONNELL

Would be pleased to meet or correspond with any one whose present Banking relations are not entirely satisfactory, or who, for any reason, propose to open a new account.

We promise to make every effort to make our Bank a safe, agreeable and profitable place to do business.

LAKE SHORE IRON WORKS

Marquette, Mich.

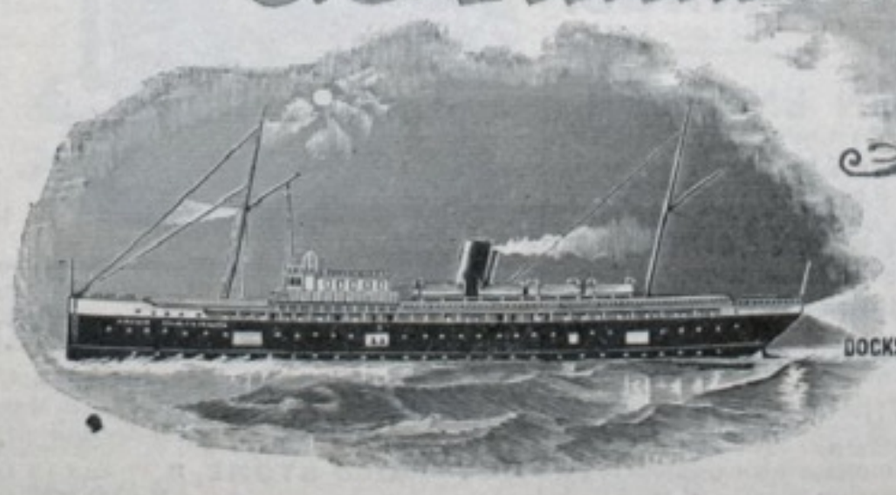


$360.00 DECK HOIST.

Stops, Starts and Reverses with one Lever.

Geared 6 to 1. 2 Cylinders, 3 in. by 6½ in.

E. S. Richardson Fueling Co.



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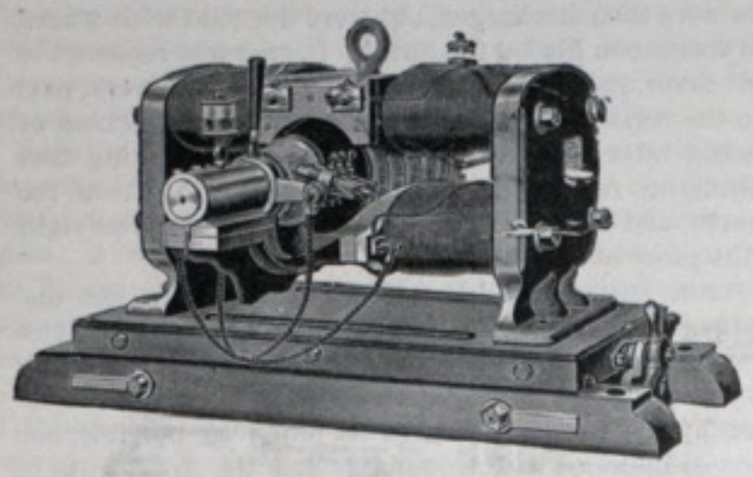

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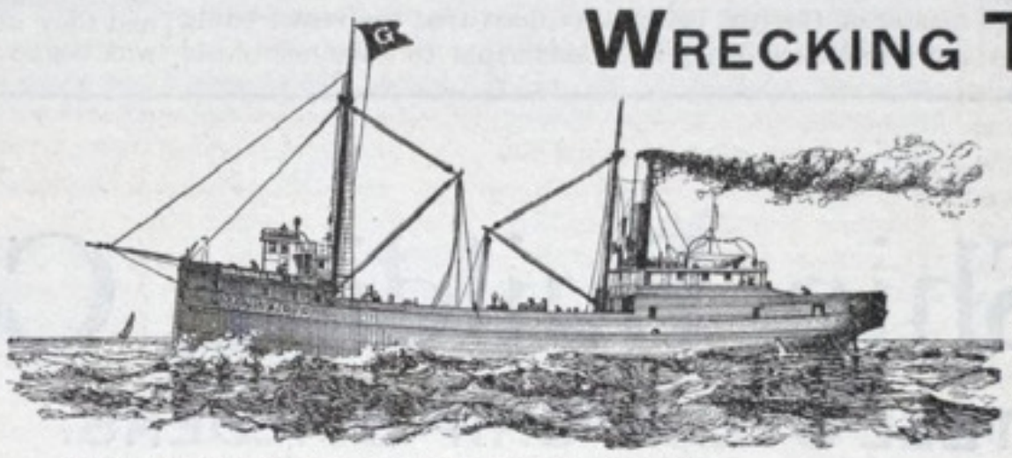

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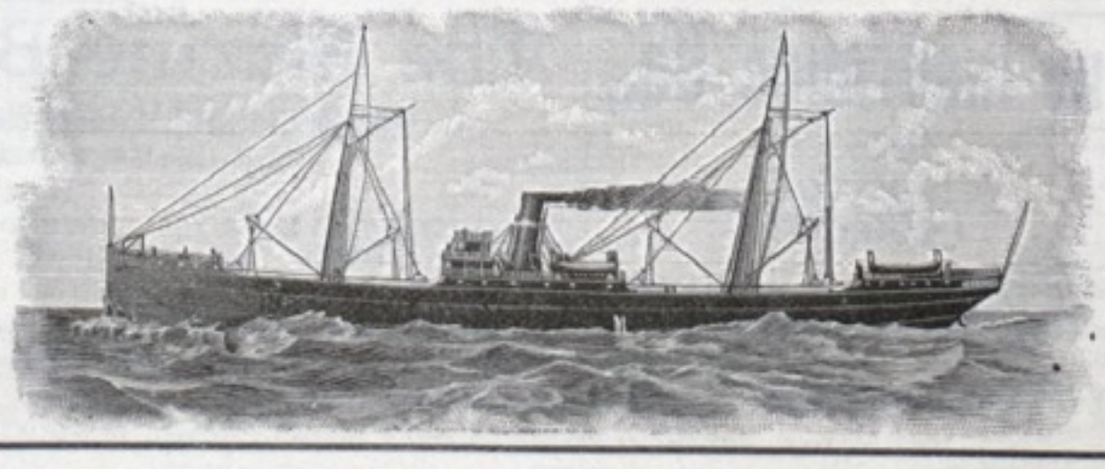

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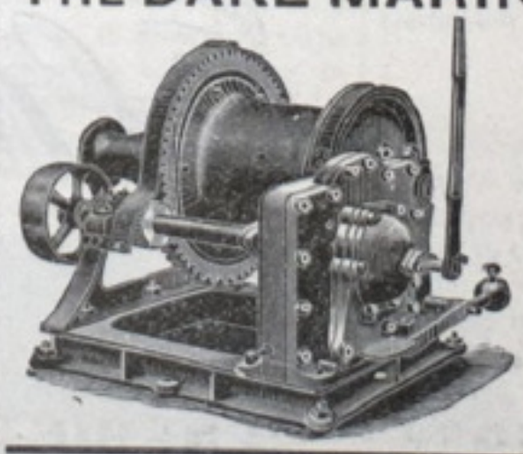

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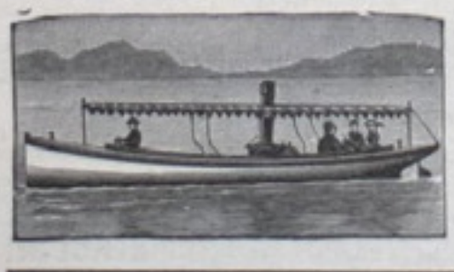

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